

ON THE PROÖSTRACUM OF A BELEMNITE FROM THE UPPER
LIAS OF ALDERTON, GLOUCESTERSHIRE.

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PLATE IX.

THE shell of the extinct genus *Belemnites* consists fundamentally of—

1. A hollow cone, the *phragmocone* (with a thin shelly wall, termed the *conotheca*), divided by transverse septa, concave above and convex below, into chambers or loculi: the septa are perforated near the ventral margin by a *siphuncle*.

2. A *guard* or *rostrum*, more or less extensively enveloping the apical part of the phragmocone.

3. A *dorsal plate* or anterior shell, which is a very thin plate extending forwards on the dorsal side, and considerably beyond the chambered portion of the phragmocone. To this Professor Huxley, in his famous memoir on the structure of the Belemnitidæ, gave the name *proöstracum*.

The *guard* or *rostrum* is the portion of the shell which is usually preserved; frequently the phragmocone also is found; but the remains of the proöstracum are so seldom met with in anything like a perfect state of preservation, that it seems desirable to place on record a specimen which has lately been acquired by the British Museum. It formed part of the Rev. P. B. Brodie's collection, and is labelled, in (as I am informed) Mr. Brodie's handwriting—"Sepiaceous portion of perhaps a belemnite. Upper Lias: Alderton, Gloucestershire. /77." The words "a belemnite" have been erased in pencil, and the words "Like *Beloteuthis*" have been added in ink.

The specimen is displayed on the two counterpart faces of a split slab of limestone, here designated A and B respectively.

It is not possible to determine the species of *Belemnites* to which the proöstracum belongs, since nearly the whole of the guard is missing; but that it belonged to a Belemnite is shown by some fragments of the anterior part of the guard which are associated with the remains of the phragmocone, and exhibit the characteristic structure of this portion of the shell.

The phragmocone is so much crushed that its exact form cannot be ascertained. Its fragments are associated with a dark-brown, almost black substance, evidently the fossilized contents of the ink-bag. On the one slab (A) this brown stain does not extend beyond the anterior part of the phragmocone, but on the other (B) the stain reaches quite to the anterior border of the proöstracum. Since this stain is

undoubtedly derived from the ink-bag, the side next the stain is considered to be the inner or ventral surface, and it is this surface which is well displayed on the slab marked A, and to which the following description chiefly applies.

The anterior portion of the phragmocone exhibits the broken edges of one or two of the septa, the anterior border being about 1 mm. in advance of the last septum, which was apparently incomplete. The phragmocone is of a brownish colour, while the proöstracum is much thinner, nearly white, and forms a layer external to the phragmocone. The anterior boundary of the latter is not distinctly marked; it is, as it were, spread over the proöstracum; and that it was a layer distinct from the latter, seems evident from the fact that the central rib of the proöstracum arises quite suddenly, as if it came up behind the phragmocone.

The proöstracum is a broad, spatuliform plate, of about the thickness of a piece of writing-paper, about four times as long as broad, somewhat contracted posteriorly, and somewhat expanded anteriorly. It is not possible to give the exact diameter of the anterior part of the phragmocone, but in its crushed condition its width is about 25.5 mm. The posterior part of the proöstracum is 19 mm. wide (about three-quarters of an inch); its length is 74 mm. (or rather more than 2 $\frac{7}{8}$ inches). Passing forwards from the anterior border of the phragmocone, it contracts slightly, so that at about 16 mm. from the border of the phragmocone it is only 17 mm. wide; thence expanding gradually, it attains its greatest width, viz. 23 mm., at about 5 mm. from the anterior extremity; it then narrows very rapidly, its antero-lateral boundaries being somewhat flattened, or even slightly concave. A small portion of the central part of the anterior extremity is wanting in the specimen, so that there appears to be a notch here in the median line: this may be accidental, and the anterior boundary may originally have been rounded and entire.

The proöstracum is bounded on either side by a longitudinally striated band, which is rather thicker than the rest of the proöstracum and is continued over the surface of the phragmocone, the impression of the longitudinal striæ being seen in one or two places where the phragmocone has been broken away. The outer boundary of each band is also thickened. At the anterior part of the phragmocone these bands (the dorsal processes of Mantell) are each 5 mm. wide; they gradually become narrower anteriorly, and disappear at the antero-lateral angles.

The median line of the proöstracum is occupied by a narrow, hollow rib, about 0.5 mm. wide, convex ventrally, and bearing a very narrow median groove. This central rib can be traced from the anterior border of the phragmocone, and is seen gradually to become wider and less distinct towards the anterior end of the proöstracum.

A narrow portion of the proöstracum on either side of the median rib is longitudinally striated; the rest of the area on each side is marked by lines which curve upwards and outwards.

As to the homologies of the Belemnite shell with the *sepion*, or

